

Chapter 2

Roanoke River Subbasin 03-02-02

Including: Dan and Mayo Rivers, Pawpaw and Jacobs Creek

2.1 Subbasin Overview

Subbasin 03-02-02 at a Glance

Land and Water Area

Total area:	231 mi ²
Land area:	229 mi ²
Water area:	2 mi ²

Population Statistics

2000 Est. Pop.:	33,541 people
Pop. Density:	146 persons/mi ²

Land Cover (percent)

Forest/Wetland:	76%
Surface Water:	0.8%
Urban:	1.3%
Cultivated Crop:	3.6%
Pasture/ Managed Herbaceous:	18.2%

Counties

Stokes, Rockingham and Guilford

Municipalities

Madison, Mayodan and Stoneville

Monitored Stream Statistics

Aquatic Life

Total Streams:	39.9 mi
Total Supporting:	35.1 mi
Total Impaired:	4.8 mi

Recreation

Total Streams:	8.3 mi
Total Not Rated:	3.5 mi
Total Impaired:	4.8 mi

This subbasin contains a very short reach of the Dan River (approximately 10 miles) and the entire North Carolina section of the Mayo River. However, most of the Mayo River watershed is located in Virginia. Most of the land is forested (76 percent), but a significant portion is also in use as cultivated cropland and pasture (22 percent). Population is expected to increase by 24 percent in Stokes County and by 8.5 percent in Rockingham County by the year 2020. However, Madison and Mayodan experienced a decline in percent change from 1990-2000 by 4.6 percent and 2.2 percent, respectively. For more information regarding population growth and trends, refer to Appendix I.

Several water quality improvement programs have been implemented in this subbasin. The NC Agriculture Cost Share Program (NCACSP), which helps reduce agricultural runoff by helping farmers implement best management practices, is one of these programs. The NCACSP provided \$226,506 towards implementing sediment and nutrient reduction practices, animal waste management, and livestock stream access elimination within this subbasin. For more information on this and other programs, refer to watershed discussion throughout this chapter as well as in Chapters 16 and 20.

Ten individual NPDES wastewater discharge permits are issued in this subbasin with a total permitted flow of 5.37 MGD. One facility is required to conduct whole effluent toxicity testing. Refer to Appendix VI for more information on NPDES permit. One registered swine operation is located in this subbasin. Refer to Chapter 16 for more information regarding animal operations within this basin.

One benthic macroinvertebrate community sample and four fish community samples (Figure 5 and Table 4) were collected during this assessment period. Data were also collected from one ambient monitoring station. Refer to the *2005 Roanoke River Basinwide Assessment Report* at <http://www.esb.enr.state.nc.us/bar.html> and Appendix IV for more information on monitoring.

Figure 5 Roanoke River Subbasin 03-02-02

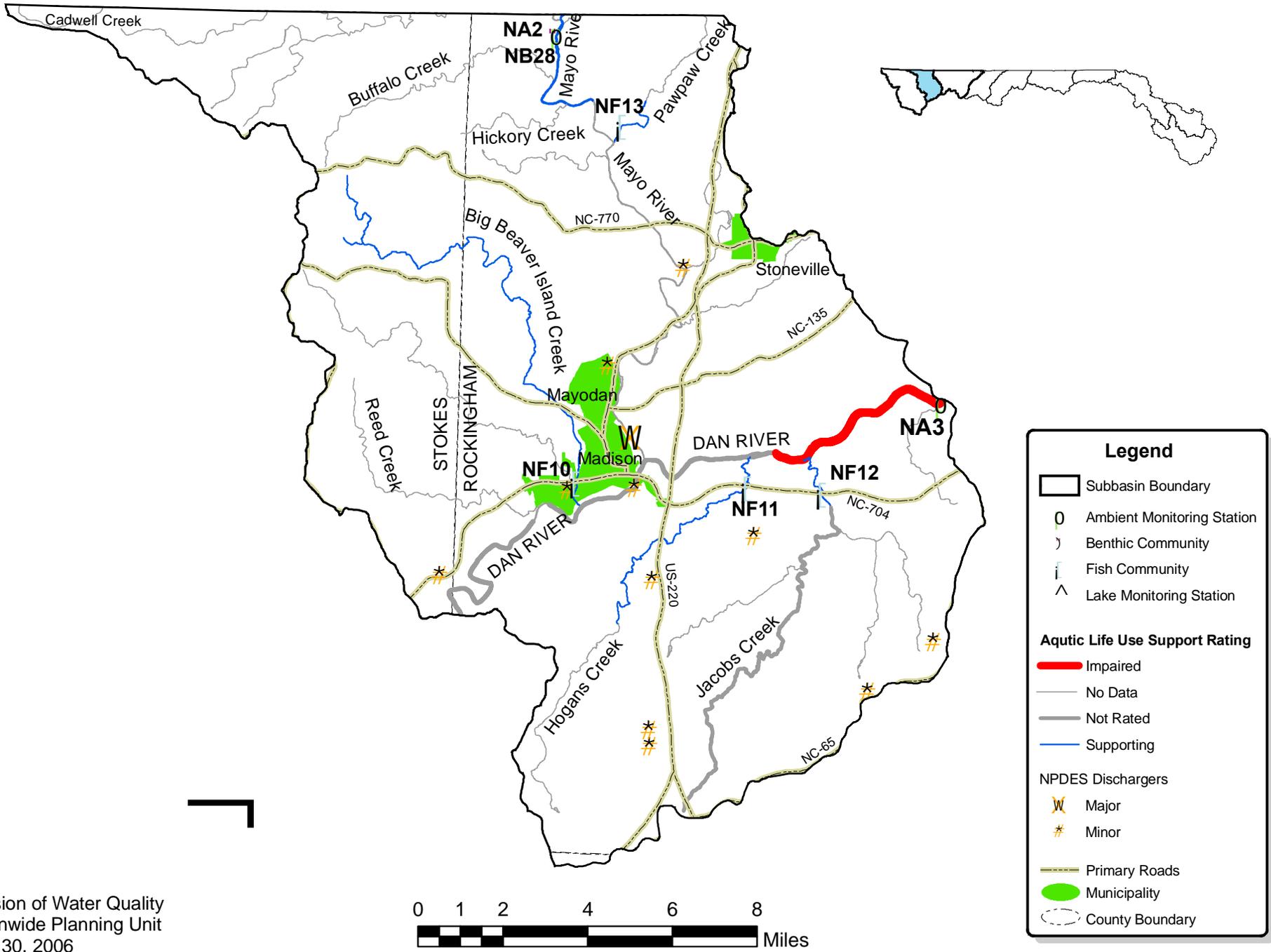


Table 4 ROANOKE Subbasin 03-02-02

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment							
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources			
Big Beaver Island Creek														
22-29	C	15.2 FW Miles	S											
From source to Dan River					NF10	G	2004							
DAN RIVER														
22-(31.5)a	WS-IV	4.8 FW Miles	I		NA3	CE	Turbidity 16.4		I	NA3	CE	Turbidity	Unknown	
From a point 0.7 mile upstream of Jacobs Creek to subbasin 03-02-02/03 boundary												Habitat Degradation	Land Clearing	
												Fecal Coliform Bacteria	Unknown	
Hogans Creek														
22-31	C	12.7 FW Miles	S											
From source to Dan River					NF11	G	2004							
Jacobs Creek														
22-32-(3)	WS-IV	1.8 FW Miles	S											
From N.C. Hwy. 704 to Dan River					NF12	G	2004							
Mayo River														
22-30-(1)	WS-V	3.5 FW Miles	S		NA2	NCE	Turbidity 8.6		NR*	NA2	CE	Fecal Coliform Bacteria	Unknown	
From North Carolina-Virginia State Line to a point 0.6 mile downstream of Hickory Creek					NB28	G	2004					Turbidity	Unknown	
Pawpaw Creek														
22-30-6-(2)	WS-IV	1.8 FW Miles	S											
From a point 1.3 mile upstream of Rockingham County SR 1360 to Mayo R.					NF13	GF	2004						Nutrient Impacts	Unknown

Table 4 ROANOKE Subbasin 03-02-02

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors
Use Categories:		Monitoring data type:		Results:		Use Support Ratings 2005:				
AL - Aquatic Life		NF - Fish Community Survey		E - Excellent		S - Supporting I - Impaired				
REC - Recreation		NB - Benthic Community Survey		G - Good		NR - Not Rated				
		NA - Ambient Monitoring Site		GF - Good-Fair		NR*- Not Rated for Recreation (screening criteria exceeded)				
		NL- Lake Monitoring		F - Fair		ND-No Data Collected to make assessment				
				P - Poor						
				NI - Not Impaired						
Miles/Acres		m- Monitored		N- Natural		Results				
FW- Fresh Water		e- Evaluated		M - Moderate		CE-Criteria Exceeded > 10% and more than 10 samples				
				S-Severe		NCE-No Criteria Exceeded				
						ID- Insufficeint Data Available				

Aquatic Life Rating Summary

Recreation Rating Summary

Fish Consumption Rating Summary

S	m	35.1	FW Miles	NR*	m	3.5	FW Miles	I	e	138.6	FW Miles
I	m	4.8	FW Miles	I	m	4.8	FW Miles				
NR	e	9.1	FW Miles	NR	e	13.2	FW Miles				
ND		89.6	FW Miles	ND		117.1	FW Miles				

A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure 5. Table 4 contains a summary of assessment units and lengths, streams monitored, monitoring data types, locations and results, along with use support ratings for waters in this subbasin. Refer to Appendix IX for more information about use support ratings.

Waters in the following sections are identified by assessment unit number(s) (AU#). This number is used to track defined segments in the water quality assessment database, 303(d) Impaired waters list and the various tables in this basin plan. The assessment unit number is a subset of the DWQ index number (classification identification number). A letter attached to the end of the AU# indicates that the assessment is smaller than the DWQ index segment. No letter indicates that the assessment unit and the DWQ index segments are the same.

2.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-02-02 in the aquatic life, recreation, fish consumption and water supply categories. All waters are Impaired on an evaluated basis in the fish consumption category because of fish consumption advice applies to the entire basin. In the water supply category, all waters are Supporting on an evaluated basis based on reports from DEH regional water treatment plant consultants.

There were 39.9 stream miles (28.8 percent) monitored during this assessment period in the aquatic life category. In the recreation category, 8.3 stream miles (6 percent) were monitored. A total of 4.8 stream miles (3.5 percent) are Impaired, for both the aquatic life and recreational use categories. Refer to Table 4 for a summary of use support ratings for waters in subbasin 03-02-02.

2.3 Status and Recommendations of Previously and Newly Impaired Waters

The following waters were either identified as Impaired in the previous basin plan (2001) or are newly Impaired based on recent data. If previously identified as Impaired, the water will either remain on the state's 303(d) list or will be delisted based on recent data showing water quality improvements. If the water is newly Impaired, it will likely be placed on the 2008 303(d) list. The current status and recommendations for addressing these waters are presented below, and each are identified by an assessment unit number (AU#). Information regarding 303(d) listing and reporting methodology is presented in Appendix VII.

2.3.1 Dan River [AU# 22-(31.5)a]

2001 Recommendations

The Dan River [AU# 22-(31.5)a], from a point 0.7 miles upstream of Jacobs Creek to subbasin 03-02-03 boundary (4.8 miles), and [AU# 22-(31.5)b, in subbasin 03-02-03] from the 03-02-02 boundary to a point 0.8 miles downstream of Matrimony Creek (9.4 miles), was Impaired due to turbidity standard violation. The 2001 basin plan recommended that DWQ would work with the Division of Land Resources to evaluate and reduce turbidity from permitted instream mining operations in the Dan River. As permits are renewed, monitoring upstream and downstream of

mining operations and instream BMPs (such as those used by the NC Department of Transportation during bridge construction) could be required. In addition, DWQ will notify local agencies of water quality concerns regarding these waters and work with them to conduct further monitoring and to locate sources of water quality protection funding.

Current Status and 2005 Recommendations

The Dan River [AU# 22-(31.5)a], from a point 0.7 mile upstream of Jacobs Creek to subbasin 03-02-03 boundary (4.8 miles), is Impaired for aquatic life and recreation due to turbidity and fecal coliform bacteria standards violations at site NA3. This section of the Dan River spans across two subbasin boundaries, refer to subbasin 03-02-03 section 3.3.1 [AU# 22-(31.5)b] for more details about data collection and recommendations for this section of the Dan River.

This section of the Dan River will be placed on the 2008 303(d) list for Fecal Coliform violations.

See Chapter 4, section 4.3.1 for Dan River summary.

2.4 Status and Recommendations for Waters with Noted Impacts

The surface waters discussed in this section are not Impaired. However, notable water quality problems and concerns were documented for these waters during this assessment. Attention and resources should be focused on these waters to prevent additional degradation and facilitate water quality improvements. DWQ will notify local agencies of these water quality concerns and work with them to conduct further assessments and to locate sources of water quality protection funding. Additionally, education on local water quality issues and voluntary actions are useful tools to prevent water quality problems and to promote restoration efforts. Nonpoint source program agency contacts are listed in Appendix VIII.

2.4.1 Pawpaw Creek [AU# 22-30-6-(2)]

Current Status and 2006 Recommendations

Pawpaw Creek, from a point 1.3 mile upstream of Rockingham County SR 1360 to Mayo River (1.8 miles), is Supporting aquatic life due to a Good-Fair fish community bioclassification at site NF13. The overall habitat was noted as high quality but no intolerant species were collected at this site. The predominant land use is agricultural and nonpoint sources of nutrients may be contributing to the abundance of the bluehead chub. DWQ will continue to monitor this site.

2.4.2 Mayo River [AU# 22-30-(1)]

Current Status and 2006 Recommendations

Mayo River, from North Carolina-Virginia State Line to a point 0.6 miles downstream of Hickory Creek (3.5) miles is Supporting aquatic life due to a Good benthic community bioclassification at site NB28. However, data from the ambient monitoring station at site NA2 show the turbidity parameter is elevated, exceeding the standard in 8.6 percent of the samples taken. DWQ will continue to monitor this site.

This section of Mayo River is Not Rated in the recreation category due to 2003 ambient monitoring fecal coliform bacteria screening criteria exceeded 25 percent of the samples were greater than 400 colonies/100 ml at site NA2. Further assessment of the fecal coliform bacteria standard was not conducted due to resource constraints.

During 2002-2003, the Mayodan WWTP received a State Revolving Loan from the DWQ Construction Grants and Loans Section to upgrade and expand from 3.0 MGD to 4.5 MGD. This was a regionalization effort to serve Stoneville WWTP and Madison. Stoneville WWTP was tied into Mayodan in 2004 which discharges 4.5 MGD into the Mayo River.

In addition to the Dan River in Stokes County, the Wildlife Resources Commission conducted mussel surveys on the Mayo River in Rockingham County between 2001 and 2002. Species collected included: the federally endangered, James spinymussel, federal species of concern green floater, and state species of concern notched rainbow (*Villosa constricta*) mussel. All mussels have a unique life cycle dependent upon habitat suitability, especially water quality. With maintenance and improvement of water quality in the basin, continued existence and possible range expansion of these rare species may be observed (WRC, memo August 2005).

Water Quality Initiatives

The NC Ecosystems Enhancement Program (EEP) is working with landowners to establish conservation easements with 300' buffers along 9,355 linear feet of river frontage on one-side of the Mayo River [AU 22-30-(1)]. EEP is also working on a similar easement on 4,038 linear feet of one side of the Mayo River [AU 22-30-(5.5)] approximately one mile downstream. The tracts targeted for protection also encompass several thousand feet of tributaries, including 2,430 feet on Buffalo Creek (AU 22-30-4), 3,154 feet on Hickory Creek (AU 22-30-5), and 2,176 feet on an unnamed tributary to the Mayo River [AU 22-30-(1)].

In addition, the Division of Parks and Recreation targeted the Mayo River for development of a new state park. The Mayo River State Park was authorized as a new unit of the state parks system in the 2003 session of the NC General Assembly. That action allows the division to further develop plans for a park and to consider land acquisition strategies. The division has worked closely with the Dan River Basin Association and the Rockingham County Planning Department to identify a study area along the river corridor from the Virginia/North Carolina border south to just above the town of Mayodan. The division hopes to assemble more than 2,000 acres for the park. The EEP preservation tracts listed above have contributed to this effort. The Dan River Basin Association and the Piedmont Land Conservancy have done much of the groundwork and continue to work with the local landowners to acquire new lands to be incorporated into the Mayo River State Park system.

2.4.3 Jacobs Creek [AU# 22-32-(3)]

Current Status and 2006 Recommendations

Jacobs Creek, from N.C. Hwy. 704 to Dan River (1.8 miles) is Supporting aquatic life due to a Good fish community bioclassification at site NF12. However, the stream exhibited substantial nonpoint source impacts such as sedimentation, bank erosion, deep scour pools, and riparian bank instability. Prolonged high water (possibly from early spring 2003 to early spring 2004)

may have contributed to the severe bank erosion, sedimentation, and resulted in the low number of fish that were collected. DWQ will continue to monitor this site.

2.4.4 Cadwell Creek [AU# 22-30-2-1-1]

The Virginia Department of Environmental Quality developed a fecal coliform bacterium TMDL for the South Mayo River. The TMDL was approved by the USEPA on February 27, 2004. Cadwell Creek was included in the TMDL since it is in the South Mayo River watershed. The TMDL recommended that in order for the standard to be met, the bacteria load would have to be reduced by 98 percent (VADEQ, 2004). To view the entire document visit, <http://www.deq.virginia.gov/tmdl/apptmdls/roankrvr/smayero.pdf>. Currently, there are no permitted facilities discharging into the North Carolina segment of Cadwell Creek. This portion of the creek makes up only 1.3 percent of the whole South Mayo River watershed.

2.5 Additional Water Quality Issues within Subbasin 03-02-02

The following section discusses issues that may threaten water quality in the subbasin that are not specific to particular streams, lakes or reservoirs.

2.5.1 Land Clearing Activities

Most of the terrain is hilly in this subbasin. Therefore, sedimentation problems are more intense during land clearing and grading activities. Sediment, when not properly controlled by BMPs, frequently causes excessive damage to the aquatic ecosystems. As land is converted from forest or agriculture to residential developments, the proper enforcement and oversight of BMPs is necessary for avoiding water quality impacts and impairments. Local governments are encouraged to implement a stricter local sediment and erosion control ordinance, which would target land-clearing activities that are less than a half acre.